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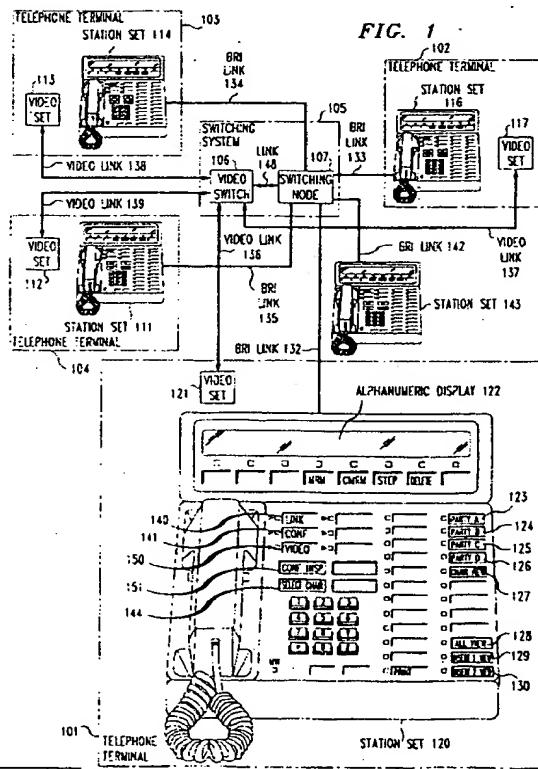
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**54** Video view selection by chairperson.

57 A switching system (105) allows any one conferee (e.g. at 101) on a video conference to assume the role of manually manipulating (144) the video picture that will be seen by all conferees (chair view) (101-104). In addition, each individual conferee (102-104) is allowed to determine their own video picture content or to select the chair view (by 123-128). Further, anyone of conferees (101-104) can assume the role of determining the chair view. In addition, for the video classroom, a chair view video picture is composed such that the picture displays the visual aid with an insert for an instructor and an insert for a student asking a question. Further, the instructor selects by using a button (129,130) or mouse which student is to be displayed in the student insert, and the video picture automatically displays that student. In another embodiment of the system, the students request permission to ask a question by actuation of a switch on their telephone set, and the names of students asking questions are displayed on a computer display screen. The instructor then can select the student by manipulating the cursor on the computer display to select the desired student.



## Technical Field

This invention relates to communication systems and, in particular, to a telecommunication switching system providing video conferencing capabilities.

## Background of the Invention

In present video conferences, a video picture seen by the conferees may be displayed in the following ways: show all the conferees, show the conferee that is talking, or show all the conferees with the talking conferee highlighted. In addition, it is known where a video conference is being conducted between two specially equipped conference rooms to allow the conferees in one conference room to control the video camera in the other conference room so as to be able to point that camera at various people or objects in the other conference room. Also, it is known where each conferee has a split screen and can select the pictures of the other conferees to be displayed in the split screen.

The problem with these capabilities is that often the video picture seen by the conferees should include a visual aid, e.g., view graph, plus the individual who is giving the presentation or the individual who is asking a question. This problem often arises where classes are being taught by video or during video business conferences. In addition, it is desirable that one individual be able to control the video picture seen by the other conferees and to compose this picture by including people or visual aids. Further, in the business conference, it is desirable for different individuals to control the video picture seen by other conferees as the topic of the business conference change. Also, each conferee needs the ability to control their own picture if they desire. In addition, in the classroom situation, it is desirable to automate the process whereby students ask questions and are displayed in the video picture.

## Summary of the Invention

The foregoing problems are solved, and a technical advance is achieved by a system and method which allows one of the conferees on the conference to assume the role of manually manipulating the content of a video picture that will be seen by all conferees (chair view). In addition, each individual conferee is allowed to determine their own video picture content or to select the chair view. These capabilities provide the reality of a virtual meeting room and allow other conferees to be freed of manipulating their own video picture content. Further, anyone of conferees can assume the role of determining the chair view which allows control of chair view to shift as the principal speaker of the video conference shifts.

In addition, for the video classroom, a video pic-

ture is composed such that the picture displays the visual aid with an insert for an instructor and an insert for a student asking a question. Further, the instructor selects by using a button or mouse which student is to be displayed in the student insert, and the video picture automatically displays that student. In another embodiment of the system, the students request permission to ask a question by actuation of a switch on their telephone set, and the names of students asking questions are displayed on a computer display screen. The instructor then can select the student by manipulating the cursor on the computer display to select the desired student. Advantageously, all control information may be communicated using the standard ISDN protocol.

## Brief Description of the Drawing

FIG. 1 illustrates, in block diagram form, a system for implementing the invention;  
 FIG. 2 illustrates the message flow for creating a video conference in accordance with the invention;  
 FIGS. 3 and 4 illustrate the software records that are created during a video conference;  
 FIG. 5 illustrates message flow for a telephone terminal selecting the chair view in accordance with the invention;  
 FIG. 6 illustrates software records that are created during a video conference;  
 FIG. 7 illustrates message flow for a telephone terminal selecting its own view in accordance with the invention;  
 FIG. 8 illustrates, in block diagram form, a system for implementing another embodiment of the invention;  
 FIGS. 9 and 10 illustrate an instructor terminal during different stages of a video conference for the system illustrated in FIG. 8;  
 FIG. 11 illustrates, in greater detail, switching node 107 of FIG. 1;  
 FIG. 12 illustrates, in greater detail, video switch 106 of FIG. 1; and  
 FIG. 13 illustrates, in flow chart form, the operations performed by telephone terminals controlling a video conference in accordance with the invention.

## Detailed Description

In block diagram form, FIG. 1 illustrates one embodiment for implementing the present invention. Telephone terminals 101 through 104 each comprise a station set and a video set. Station sets 111, 114, and 116 are identical to station set 120. Similarly, video sets 112, 113, 117, and 121 are the same. Each video set includes a video display, video camera, and audio devices. Station set 143 has no associated video set;

hence, a user of station set 143 has only audio communication. While a video conference is in process, both video and audio information is communicated via the video sets. Switching system 105 controls the switching of audio and video information. Control information is transmitted to and from the station sets via BRI links 132 through 135. Switching node 105 utilizes the control information received via the BRI links to control video switch 106 and also to control the conferencing of the audio information. Audio information is transmitted from the video sets via video links 136 through 139. The audio information received by video switch 106 is conference together and transferred back to the video sets.

The internal structure of switching node 107 is described in greater detail with respect to FIG. 3 and in U.S. Patent 5,182,750. In addition, the software architecture is also described in the latter U.S. Patent.

Each telephone terminal has associated with it a terminal management software application. The terminal management applications are executing either on the computer controlling switching node 107 or within each of the station sets. The terminal management application controlling a video conference is the terminal management application of the station set that originated the video conference call. The controlling terminal management application communicates with the other terminal management applications utilizing standard ISDN protocol messages. These messages are switched via switching node 107.

Using a telephone terminal, such as telephone terminal 101, a user can establish a video conference and determine the chair view by designating themselves as the chairperson. In addition, any user on the video conference can select to look at any one of the parties on the conference, all the parties simultaneously, chair view, or an insert view which allows a fixed number of parties to be displayed. To understand how these different functions are performed consider the following examples. In a first example, the user of telephone terminal 101 establishes a video telephone call by depressing line button 140 and video button 150. The user then dials the telephone number of another telephone terminal which in the present example is assumed to be telephone terminal 102. Since telephone terminal 101 is indicating to switching node 107 via BRI link 132 that the call is to be a video call, switching node 107 alerts station set 116 to this fact and sets up the necessary video connection through video switch 106. After a call has been established between telephone terminal 101 and telephone terminal 102, the user of telephone terminal 101 then utilizes conference button 141 to bring telephone terminals 103 and 104 into a video conference. Each of the telephone terminals is assigned to buttons 123 through 126 as each is joined onto the telephone call. In the present example, party A is telephone terminal 101, and party B is telephone terminal

102. By default, all telephone terminals display the all-view picture until a user selects another view.

In addition, station set 143, which has no associated video set, can be part of the audio portion of the video conference. Greater detail on how station set 143 can be part of the video conference is given with respect to FIGS. 11 and 12.

To designate the chair view, the user of telephone terminal 101 first actuates select chair button 144 and then the appropriate button to designate the picture content. For example, if the user of telephone terminal 101 wants to display all of the parties on the conference for the chair view, the user actuates all-view button 128 after actuating select chair button 144.

15 When select chair button 144 is first actuated, an indicator light, that is located with select chair button 144, is turned on to indicate that the telephone terminal is specifying the chair view. Telephone terminal 101 will continue to specify the chair view until select chair button 144 is actuated a second time which also turns off the indicator light. While the indicator light is on, any view selected by the user of telephone terminal 101 becomes the chair view.

In another implementation of chair view designation, the user of telephone terminal 101 first actuates select chair button 144 and then the appropriate button or buttons to designate the picture content. After the user has designated the picture content, subsequent picture selections by the user do not change the chair view but rather only effect the picture displayed on telephone terminal 101. In order to change the chair view again, the user of telephone terminal 101 must first actuate the select chair button 144 before making a picture selection.

35 The insert view consists of a larger picture having one or two smaller pictures inserted into the larger picture. To select an insert view, the user of telephone terminal 101 first selects the view that is to be the larger picture by actuation of the appropriate button and then actuates insert 1 button 129 followed by the actuation of the button which designates the picture to be placed in the first insert. If the user desires two inserts, the user actuates insert 2 button 130 followed by the actuation of the button which designates the picture to be placed in the second insert. The user can change either inserts any time by actuation of either insert 1 button 129 or insert 2 130 followed by actuation of the button designating the desired picture. An insert is removed from the video set by actuating the appropriate insert button twice without designation of a picture between the two actuations. If telephone terminal 101 is specifying the chair view during the actuation of the insert buttons, the resulting picture will be the chair view. Those skilled in the art could readily envision methods for having more than two inserts. For example, if the picture from telephone terminal 102 is to be the large picture and the pictures from telephone terminals 103 and 104 are to be the

inserts, the user of telephone terminal 101 actuates party B button 124, insert 1 button 129, party C button 125, insert 2 button 130 and party D button 126 in that order. This results in the desired insert view being configured.

During the video conference, the users of the telephone terminals can select the various pictures they wish to see. For example, the user of telephone terminal 101 can select any of the parties, the chair view, and the all party view, by actuations of buttons 123 through 128.

FIG. 2 illustrates the message flow utilized to set up a video conference call by telecommunication terminal 101. The setup message of line 201 which is transmitted from telecommunication terminal 101 to telecommunication terminal 102 via switch 105 specifies to switch 105 that a video call is being setup. Lines 202 through 205 complete this video call between telecommunication terminal 101 and telecommunication terminal 102. In line 206, telecommunication terminal 101 transmits a second setup message to telecommunication terminal 103 which also specifies a video call. In line 208, telecommunication terminal 101 transmits a merge message to switch 105 requesting that switch 105 form a video conference call between telecommunication terminals 101, 102, and 103. Switch 105 is responsive to the merge message of line 208 to default to the all-view format. The notify messages of lines 211, 213, and 216 are utilized to inform the various station sets of the identity of parties on the video conference. In line 217, telecommunication terminal 101 transmits a setup message via switch 105 to telecommunication terminal 104. On obtaining the connect message of line 228, telecommunication terminal 101 transmits the connect acknowledge message of line 229 and a merge message in line 219 to switch 105 requesting that telecommunication terminal 104 be merged into the video conference call. The messages of lines 223, 224, 230, and 231 complete the transfer of information to the various telecommunication terminals. Note, that the designations A, B, C, and D, refer to telecommunication terminals 101 through 104, respectively.

After the video conference has been established, the user of telephone terminal 101 actuates the chair view button 127. Telephone terminal 101 transmits the notify messages of lines 232, 233, and 234 to inform telephone terminals 102, 103, and 104 that telephone terminal 101 is controlling the chair view. The telephone terminal, that is the chairperson, is defined by the "CH" portion of the notify message. Video switch 106 defaults to the all view picture, when a video conference is initially set up. FIG. 5 illustrates the message flow when terminal telephone 104 becomes the chairperson. Telephone terminals 102 and 103 would cause a similar message flow if they become chairperson.

FIG. 3 illustrates the records which have been set

up in telecommunication terminals 101 through 104 in response to the messages of FIG. 2. The records and managers are located in the highest software layer, the application layer, of the software structure of the station sets. As is described in greater detail later, the terminal manager application invokes the video conference manager application upon actuation of the conference button subsequent to the actuation of the video button. Each terminal manager application maintains a party record for each half of the call in which the terminal manager application is involved. Each party record contains a record of the names of users and addresses (telephone numbers) of the parties on the other half of the call. For example, party records 302, 303, and 314 contain the names and telephone numbers of the users of telecommunication terminals 102, 103, and 104, respectively. Telecommunication terminals 102, 103, and 104 reflect in their party records (306, 308, and 313, respectively) the telecommunication terminal that is the controlling telecommunication terminal and the sub-party telecommunication terminals. In party record 306, the name and telephone number for station set 101 have an asterisk before them denoting the controlling party. Similarly, the party records also reflect which station set (chairperson) is controlling the chair view by placing an exclamation mark. For example, in party record 306 the name and telephone number for telecommunication terminal 101 have an exclamation mark before them denoting the chair person.

FIG. 3 only illustrates the logical message channels (such as logical channel 310) that are established between the telecommunication terminals via the switches. These logical channels allow the communication of messages between terminal managers. The manner in which these logical channels are established is set forth in the above referenced U.S. Patent. More information on how the conference record and party records are built is given in a U.S. Patent application entitled "Telephone Terminal Controlled Conference Inspection", Serial Number 07/996350, filed December 23, 1992, and assigned to the same assignee as the present application.

To further understand the functions, consider now the situation where the user of telecommunication terminal 104 actuates the select chair button, party A button, insert 1 button, party B button, insert 2 button, and party C button. The result is that the user of telephone terminal 104 is now the chair person and the chair view has been changed to an insert view with party A as the main picture and parties B and C as insert pictures. To achieve this result, the terminal manager of telephone terminal 104 transmits the user information message of line 501 of FIG. 5 to terminal manager 305 of telephone terminal 101. This user information message informs terminal manager 305 in telephone terminal 104 that telephone terminal 104 is to determine the chair view. Terminal manager 305 is

responsive to this information to update video conference record 301 as illustrated in FIG. 4 and to transmit the notify messages of lines 504 and 505 of FIG. 5 to telephone terminals 102 and 103 so that telephone terminals can update their information with respect to the chair person. The notify message of line 506 confirms to telephone terminal 104 that it is controlling the chair view. These updates are also illustrated in FIG. 4. Terminal manager 315 of telephone terminal 104 responds to the notify message of line 506 by transmitting the user information message of line 509 which informs terminal manager 305 that chair view is to be that described at the beginning of this paragraph. In response to the user information message of line 509, terminal manager 305 transmits to switching system 105 the facility message of line 512. In response, switching system 105 sets up the requested chair view. The manner in which switching system 105 responds to that user information message is described with respect to FIGS. 11 and 12.

Assume now that the user of telephone terminal 102 does not want to see the chair view selected by telephone terminal 104 but rather wishes to see only the user of telephone terminal 101. To accomplish this, the user of telephone terminal 102 actuates the party A button on station set 116. As illustrated in line 701 of FIG. 7, terminal manager 307 of terminal 102 transmits a user information message to terminal manager 305 of telephone terminal 101 requesting only the picture of party A. Terminal manager 305 of telephone terminal 101 is responsive to the user information message to modify conference record 301 as illustrated in FIG. 6. Terminal manager 305 transmits the facility message of line 703 to have only the picture from telephone terminal 101 switched to telephone terminal 102.

FIG. 8 illustrates, in block diagram form, a system for implementing a video classroom in accordance with the invention. Each student who is located at a remote site is equipped with a student terminal such as student terminal 806. Student terminal 806 gives the student the ability to send a signal that the student has a question to instructor terminal 801 by actuation of question button 813. Student terminal 806 does not provide the capability for the student to become the chairperson. The student has the option of three views by actuation of buttons 815 through 817. Student terminal 805 through 806 are interconnected to switching system 105 by links 820 through 821. It is well known in the art that links 820 through 821 could be switched through the public telephone network. Visual aid terminal 804 consists of only a video camera and is utilized to display the blackboard, etc. that is being utilized by the instructor. Instructor terminal 801 utilizes station set 802 to provide the instructor with the necessary capability for running a video class.

Using methods well known in the art, the terminal

manager of station set 802 is responsive to actions by the user on keyboard 906 and mouse 907 to convert those actions to stimuli for the video conference manager.

FIG. 9 shows in greater detail station set 802 of instructor terminal 801. The students in the class who are party to the video conference are displayed by name only on display 904. The instructor utilizes mouse 907 to select the view that will be seen by the students and by the instructor personally by utilizing cursor 901. To start the class, the instructor actuates start class button 905 which causes station set 802 to set up a video conference via switching system 105 and the student terminals. The instructor can determine the chair view by actuating select chair button 902 and then selecting either an individual student, the all-view picture, or an insert view. (Note, that buttons 902, 903, and 905 could be replaced by icons on display 904 which would be selected by mouse 907 using cursor 901.) The insert view is different than that previously described with respect to how the pictures are determined. In the insert view, the main picture is determined by positioning the cursor 901 next to the desired picture designation, such as VISUAL AID 911, and actuating the appropriate switch on mouse 907. If the instructor is to be shown in an insert, the cursor 901 is positioned next to INSERT INSTRUCTOR 909, and the switch on the mouse 907 is actuated. The instructor insert can be removed from the picture by positioning the cursor 901 next to INSERT INSTRUCTOR 909 and actuating the switch on mouse 907 a second time. While the cursor 901 is positioned next to INSERT STUDENT 910 entry, a student can be placed in the student insert by actuating the switch on mouse 907 and then, selecting the student entry by using the mouse. Until the cursor 901 is positioned next to INSERT STUDENT 910 entry and the switch on mouse 907 actuated a second time, the selection of an entry on the left side of display 904 by using the mouse results in the corresponding picture being placed in the student insert portion of the main picture.

Another embodiment for handling questions from students is to utilize the question buttons on the students' station sets, such as question button 813 of station set 811 of FIG. 8. When the instructor activates questions button 903, station set 802 enters a mode whereby station set 802 is responsive to actuations of question buttons on student terminals to place the name of the student actuating the question button into a queue. The use of such queues is well known to those skilled in the art, and the queue is implemented by the terminal manager which provides stimuli to the video conference manager based on the contents of the queue. The names of the students are displayed in the order in which their requests are received. FIG. 10 illustrates station set 802 while in the questions mode and illustrates that Joe Smith and

Jane Smith have activated their question buttons. The mode of the station set is displayed by the entry, "QUESTION MODE" 908. Cursor 901 is positioned next to the entry, QUESTION MODE 908. In addition, the student first in the queue (Joe Smith) is automatically placed in the student portion of the insert view. As the instructor finishes answering the question of one student, the instructor activates the appropriate switch on mouse 907 with the cursor positioned next to QUESTION MODE 908. The student next in the queue is displayed in the student insert and display 908 is automatically updated. For the present example only the name, JANE SMITH, would appear on display 908. If the instructor wishes to answer questions out of order, she/he positions cursor 901 next to that student's name and actuates the switch on mouse 907. To return to answering the questions in order, the instructor positions cursor 901 next to QUESTION MODE 908 and actuates the switch on mouse 907.

FIGS. 11 and 12 illustrate, in greater detail, switching system 105. FIG. 11 illustrates switching node 107, and FIG. 12 illustrates video switch 106. The manner in which node processor 1107 functions with blocks 1115 through 1120 is described in detail in U. S. Patent 5,182,750. Similarly, the latter patent describes the interaction between the software layers 1100 through 1106 and local angel 1112. Further, the manner in which remote angel 1120 functions with node processor 1107 over communication path 1124 is also detailed in that U. S. patent. Telephone terminals 1101 through 1104 are interconnected to switching node 107 via BRI links such as BRI link 132. Control information transmitted on these BRI links is processed through local angel 1112 before being communicated to the software layers 1100 through 1106. Video switch 106 is controlled by remote angel 1120 via link 148. Communication information between software layers 1100 through 1106 is communicated with remote angel 1120 via communication path 1124. Remote angel 1120 is responsive to this information to transmit control messages via control cable 1122 to video switch 106.

All control messages which are transmitted to switching system 105 via the BRI links of the telephone terminals are communicated to connection manager 1125 via the underlying software layers, local angel 1112, network 1115, and the appropriate interface. For example, the user information message of line 512 of FIG. 5 is transmitted from telephone terminal 101 via BRI link 132 to connection manager 1125 via the above-recited path. Connection manager 1125 is responsive to the user information message of line 512 to formulate the necessary information which is communicated to remote angel 1120 so that remote angel 1120 transmits the necessary connection information to video switch 106 via control cable 1122.

Video switch 106 is illustrated, in greater detail, in FIG. 12. Controller 1201 is responsive to connection control messages received via control cable 1122 to control video router 1202. Video and audio information are received via video links 136 through 139. Codecs 1206 through 1209 separate the video information from the audio information. The video information is transmitted to video router 1202, and the audio information is transmitted to analog voice bridge 1205.

5 Quad screen formatter 1210 is used to format the all-view picture by accepting four video outputs from video router 1202 are from each of the four codecs. Controller 1201 controls video router 1202 to perform this switching. Split screen formatter 1204 functions in a similar manner. The resulting output picture produced by quad screen formatter 1210 or split screen formatter 1204 is transmitted to video router 1202 where under control controller 1201 this output can be sent back to any of the codecs.

10 Analog voice bridge 1205 receives the audio information from the codecs, combines this audio information, and transfers the combined audio information back to each codec. It is possible for a BRI station set not having been an associated video set to be part of the audio portion of a conference. For example, station set 143 of FIG. 1 can be part of the audio portion of the conference. Node processor 1107 is responsive to control information received via BRI link 142 from station set 143 to set up network 1115 so that audio information is communicated between station set 143 and analog voice bridge 1205 via interface 1117, BRI link 142, network 1115, interface 1118, BRI link 1121, and BRI terminator 1203. Analog voice bridge 1205 receives the analog voice information from BRI terminator 1203 and combines this with the audio information received from codecs 1206 through 1209. BRI terminator 1203 receives the audio information outputted by audio voice bridge 1205, encodes this information, and transmits it via BRI link 1121, interface 1118, network 1115, interface 1117, and BRI link 142 to station set 143.

15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300 305 310 315 320 325 330 335 340 345 350 355 360 365 370 375 380 385 390 395 400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 475 480 485 490 495 500 505 510 515 520 525 530 535 540 545 550 555 560 565 570 575 580 585 590 595 600 605 610 615 620 625 630 635 640 645 650 655 660 665 670 675 680 685 690 695 700 705 710 715 720 725 730 735 740 745 750 755 760 765 770 775 780 785 790 795 800 805 810 815 820 825 830 835 840 845 850 855 860 865 870 875 880 885 890 895 900 905 910 915 920 925 930 935 940 945 950 955 960 965 970 975 980 985 990 995 1000 1005 1010 1015 1020 1025 1030 1035 1040 1045 1050 1055 1060 1065 1070 1075 1080 1085 1090 1095 1100 1105 1110 1115 1120 1125 1130 1135 1140 1145 1150 1155 1160 1165 1170 1175 1180 1185 1190 1195 1200 1205 1210 1215 1220 1225 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2230 2235 2240 2245 2250 2255 2260 2265 2270 2275 2280 2285 2290 2295 2300 2305 2310 2315 2320 2325 2330 2335 2340 2345 2350 2355 2360 2365 2370 2375 2380 2385 2390 2395 2400 2405 2410 2415 2420 2425 2430 2435 2440 2445 2450 2455 2460 2465 2470 2475 2480 2485 2490 2495 2500 2505 2510 2515 2520 2525 2530 2535 2540 2545 2550 2555 2560 2565 2570 2575 2580 2585 2590 2595 2600 2605 2610 2615 2620 2625 2630 2635 2640 2645 2650 2655 2660 2665 2670 2675 2680 2685 2690 2695 2700 2705 2710 2715 2720 2725 2730 2735 2740 2745 2750 2755 2760 2765 2770 2775 2780 2785 2790 2795 2800 2805 2810 2815 2820 2825 2830 2835 2840 2845 2850 2855 2860 2865 2870 2875 2880 2885 2890 2895 2900 2905 2910 2915 2920 2925 2930 2935 2940 2945 2950 2955 2960 2965 2970 2975 2980 2985 2990 2995 3000 3005 3010 3015 3020 3025 3030 3035 3040 3045 3050 3055 3060 3065 3070 3075 3080 3085 3090 3095 3100 3105 3110 3115 3120 3125 3130 3135 3140 3145 3150 3155 3160 3165 3170 3175 3180 3185 3190 3195 3200 3205 3210 3215 3220 3225 3230 3235 3240 3245 3250 3255 3260 3265 3270 3275 3280 3285 3290 3295 3300 3305 3310 3315 3320 3325 3330 3335 3340 3345 3350 3355 3360 3365 3370 3375 3380 3385 3390 3395 3400 3405 3410 3415 3420 3425 3430 3435 3440 3445 3450 3455 3460 3465 3470 3475 3480 3485 3490 3495 3500 3505 3510 3515 3520 3525 3530 3535 3540 3545 3550 3555 3560 3565 3570 3575 3580 3585 3590 3595 3600 3605 3610 3615 3620 3625 3630 3635 3640 3645 3650 3655 3660 3665 3670 3675 3680 3685 3690 3695 3700 3705 3710 3715 3720 3725 3730 3735 3740 3745 3750 3755 3760 3765 3770 3775 3780 3785 3790 3795 3800 3805 3810 3815 3820 3825 3830 3835 3840 3845 3850 3855 3860 3865 3870 3875 3880 3885 3890 3895 3900 3905 3910 3915 3920 3925 3930 3935 3940 3945 3950 3955 3960 3965 3970 3975 3980 3985 3990 3995 4000 4005 4010 4015 4020 4025 4030 4035 4040 4045 4050 4055 4060 4065 4070 4075 4080 4085 4090 4095 4100 4105 4110 4115 4120 4125 4130 4135 4140 4145 4150 4155 4160 4165 4170 4175 4180 4185 4190 4195 4200 4205 4210 4215 4220 4225 4230 4235 4240 4245 4250 4255 4260 4265 4270 4275 4280 4285 4290 4295 4300 4305 4310 4315 4320 4325 4330 4335 4340 4345 4350 4355 4360 4365 4370 4375 4380 4385 4390 4395 4400 4405 4410 4415 4420 4425 4430 4435 4440 4445 4450 4455 4460 4465 4470 4475 4480 4485 4490 4495 4500 4505 4510 4515 4520 4525 4530 4535 4540 4545 4550 4555 4560 4565 4570 4575 4580 4585 4590 4595 4600 4605 4610 4615 4620 4625 4630 4635 4640 4645 4650 4655 4660 4665 4670 4675 4680 4685 4690 4695 4700 4705 4710 4715 4720 4725 4730 4735 4740 4745 4750 4755 4760 4765 4770 4775 4780 4785 4790 4795 4800 4805 4810 4815 4820 4825 4830 4835 4840 4845 4850 4855 4860 4865 4870 4875 4880 4885 4890 4895 4900 4905 4910 4915 4920 4925 4930 4935 4940 4945 4950 4955 4960 4965 4970 4975 4980 4985 4990 4995 5000 5005 5010 5015 5020 5025 5030 5035 5040 5045 5050 5055 5060 5065 5070 5075 5080 5085 5090 5095 5100 5105 5110 5115 5120 5125 5130 5135 5140 5145 5150 5155 5160 5165 5170 5175 5180 5185 5190 5195 5200 5205 5210 5215 5220 5225 5230 5235 5240 5245 5250 5255 5260 5265 5270 5275 5280 5285 5290 5295 5300 5305 5310 5315 5320 5325 5330 5335 5340 5345 5350 5355 5360 5365 5370 5375 5380 5385 5390 5395 5400 5405 5410 5415 5420 5425 5430 5435 5440 5445 5450 5455 5460 5465 5470 5475 5480 5485 5490 5495 5500 5505 5510 5515 5520 5525 5530 5535 5540 5545 5550 5555 5560 5565 5570 5575 5580 5585 5590 5595 5600 5605 5610 5615 5620 5625 5630 5635 5640 5645 5650 5655 5660 5665 5670 5675 5680 5685 5690 5695 5700 5705 5710 5715 5720 5725 5730 5735 5740 5745 5750 5755 5760 5765 5770 5775 5780 5785 5790 5795 5800 5805 5810 5815 5820 5825 5830 5835 5840 5845 5850 5855 5860 5865 5870 5875 5880 5885 5890 5895 5900 5905 5910 5915 5920 5925 5930 5935 5940 5945 5950 5955 5960 5965 5970 5975 5980 5985 5990 5995 6000 6005 6010 6015 6020 6025 6030 6035 6040 6045 6050 6055 6060 6065 6070 6075 6080 6085 6090 6095 6100 6105 6110 6115 6120 6125 6130 6135 6140 6145 6150 6155 6160 6165 6170 6175 6180 6185 6190 6195 6200 6205 6210 6215 6220 6225 6230 6235 6240 6245 6250 6255 6260 6265 6270 6275 6280 6285 6290 6295 6300 6305 6310 6315 6320 6325 6330 6335 6340 6345 6350 6355 6360 6365 6370 6375 6380 6385 6390 6395 6400 6405 6410 6415 6420 6425 6430 6435 6440 6445 6450 6455 6460 6465 6470 6475 6480 6485 6490 6495 6500 6505 6510 6515 6520 6525 6530 6535 6540 6545 6550 6555 6560 6565 6570 6575 6580 6585 6590 6595 6600 6605 6610 6615 6620 6625 6630 6635 6640 6645 6650 6655 6660 6665 6670 6675 6680 6685 6690 6695 6700 6705 6710 6715 6720 6725 6730 6735 6740 6745 6750 6755 6760 6765 6770 6775 6780 6785 6790 6795 6800 6805 6810 6815 6820 6825 6830 6835 6840 6845 6850 6855 6860 6865 6870 6875 6880 6885 6890 6895 6900 6905 6910 6915 6920 6925 6930 6935 6940 6945 6950 6955 6960 6965 6970 6975 6980 6985 6990 6995 7000 7005 7010 7015 7020 7025 7030 7035 7040 7045 7050 7055 7060 7065 7070 7075 7080 7085 7090 7095 7100 7105 7110 7115 7120 7125 7130 7135 7140 7145 7150 7155 7160 7165 7170 7175 7180 7185 7190 7195 7200 7205 7210 7215 7220 7225 7230 7235 7240 7245 7250 7255 7260 7265 7270 7275 7280 7285 7290 7295 7300 7305 7310 7315 7320 7325 7330 7335 7340 7345 7350 7355 7360 7365 7370 7375 7380 7385 7390 7395 7400 7405 7410 7415 7420 7425 7430 7435 7440 7445 7450 7455 7460 7465 7470 7475 7480 7485 7490 7495 7500 7505 7510 7515 7520 7525 7530 7535 7540 7545 7550 7555 7560 7565 7570 7575 7580 7585 7590 7595 7600 7605 7610 7615 7620 7625 7630 7635 7640 7645 7650 7655 7660 7665 7670 7675 7680 7685 7690 7695 7700 7705 7710 7715 7720 7725 7730 7735 7740 7745 7750 7755 7760 7765 7770 7775 7780 7785 7790 7795 7800 7805 7810 7815 7820 7825 7830 7835 7840 7845 7850 7855 7860 7865 7870 7875 7880 7885 7890 7895 7900 7905 7910 7915 7920 7925 7930 7935 7940 7945 7950 7955 7960 7965 7970 7975 7980 7985 7990 7995 8000 8005 8010 8015 8020 8025 8030 8035 8040 8045 8050 8055 8060 8065 8070 8075 8080 8085 8090 8095 8100 8105 8110 8115 8120 8125 8130 8135 8140 8145 8150 8155 8160 8165 8170 8175 8180 8185 8190 8195 8200 8205 8210 8215 8220 8225 8230 8235 8240 8245 8250 8255 8260 8265 8270 8275 8280 8285 8290 8295 8300 8305 8310 8315 8320 8325 8330 8335 8340 8345 8350 8355 8360 8365 8370 8375 8380 8385 8390 8395 8400 8405 8410 8415 8420 8425 8430 8435 8440 8445 8450 8455 8460 8465 8470 8475 8480 8485 8490 8495 8500 8505 8510 8515 8520 8525 8530 8535 8540 8545 8550 8555 8560 8565 8570 8575 8580 8585 8590 8595 8600 8605 8610 8615 8620 8625 8630 8635 8640 8645 8650 8655 8660 8665 8670 8675 8680 8685 8690 8695 8700 8705 8710 8715 8720 8725 8730 8735 8740 8745 8750 8755 8760 8765 8770 8775 8780 8785 8790 8795 8800 8805 8810 8815 8820 8825 8830 8835 8840 8845 8850 8855 8860 8865 8870 8875 8880 8885 8890 8895 8900 8905 8910 8915 8920 8925 8930 8935 8940 8945 8950 8955 8960 8965 8970 8975 8980 8985 8990 8995 9000 9005 9010 9015 9020 9025 9030 9035 9040 9045 9050 9055 9060 9065 9070 9075 9080 9085 9090 9095 9100 9105 9110 9115 9120 9125 9130 9135 9140 9145 9150 9155 9160 9165 9170 9175 9180 9185 9190 9195 9200 9205 9210 9215 9220 9225 9230 9235 9240 9245 9250 9255 9260 9265 9270 9275 9280 9285 9290 9295 9300 9305 9310 9315 9320 9325 9330 9335 9340 9345 9350 9355 9360 9365 9370 9375 9380 9385 9390 9395 9400 9405 9410 9415 9420 9425 9430 9435 9440 9445 9450 9455 9460 9465 9470 9475 9480 9485 9490 9495 9500 9505 9510 9515 9520 9525 9530 9535 9540 9545 9550 9555 9560 9565 9570 9575 9580 9585 9590 9595 9600 9605 9610 9615 9620 9625 9630 9635 9640 9645 9650 9655 9660 9665 9670 9675 9680 9685 9690 9695 9700 9705 9710 9715 9720 9725 9730 9735 9740 9745 9750 9755 9760 9765 9770 9775 9780 9785 9790 9795 9800 9805 9810 9815 9820 9825 9830 9835 9840 9845 9850 9855 9860 9865 9870 9875 9880 9885 9890 9895 9900 9905 9910 9915 9920 9925 9930 9935 9940 9945 9950 9955 9960 9965 9970 9975 9980 9985 9990 9995

Decision block 1302 determines if a new message has arrived at any of the terminals. If the answer is no, then decision block 1302 is re-executed. Decision block 1303 is invoked when terminal manager 305 receives a new message from any of the station sets including station set 120. Decision block 1303 determines whether the message is a disconnect. If the answer is yes, decision block 1304 determines if there is still more than one party left on the call. If the answer to decision block 1304 is no, block 1308 terminates the call. Returning to decision block 1304, if the answer is yes, block 1306 transmits notifying messages to the remaining terminal managers informing them that the sending terminal has disconnected. Block 1307 then updates conference record 301 to reflect that the sending terminal is no longer part of the call.

Returning to decision block 1303, if the answer is no, decision block 1309 is executed to determine whether the message is an indication of a chairperson selection from the sending terminal. If the answer is yes, decision block 1310 determines whether the sending terminal had already designated itself as a chairperson. If the answer is yes, this means that the sending terminal no longer is the chairperson, and block 1313 is executed to notify all terminal managers that there is no longer a terminal who is the chairperson. Finally, block 1317 is executed to update the conference record. Returning to decision block 1310, if the answer is no, then notify messages are transmitted to all terminal managers to notify them that the sending terminal is now the chairperson. Finally, block 1315 is executed to update the conference record. The operation of blocks 1310, 1313-1315, and 1317 allows the terminal that has become the chairperson to remain the chairperson until second chairperson selection message is received. In order for that terminal to determine a picture only for itself, the second chairperson selection message must be sent.

Returning to decision block 1309, if the answer is no, decision block 1316 is executed to determine whether the sending terminal had actuated the all-view button. If the answer is yes, control is transferred to decision block 1319 which determines whether the sending terminal is the chairperson. If the answer is yes, block 1320 updates the conference record to reflect that the chair view is now the all-view picture. By execution of block 1321, the necessary messages are then sent to the switching system to provide the all-view picture to all terminals which are receiving the chair view. Returning to decision block 1319, if the answer is no, control is transferred to block 1322 which updates the conference record to reflect that the sending terminal is now receiving the all-view picture. Finally, block 1325 is executed which transmits the necessary command to switching system 105 to provide the all-view picture to the sending telephone terminal.

Returning to decision block 1316, if the answer is no, decision block 1326 is executed to determine whether the message is an indication that one of the two insert buttons has been actuated. In the discussion of blocks 1327 through 1337, it should be understood that there is one insert flag for each insert button on each station set and that the logic illustrated in blocks 1327, 1328, 1331 through 1334 and 1337 is performed separately for each of these insert flags on each station set. If the answer to decision block 1326 is yes, control is transferred to 1327 which determines if the insert flag has already been set for that button. If the insert flag has already been set, this means that the user of the station set wants to remove the associated insert picture. Similarly, if the insert flag is not set, it means that the user wants to specify what the picture should be for this particular insert. If the answer to decision block 1327 is no, block 1328 is executed which sets the insert flag for the insert button causing the message. Block 1331 sends a notifying message back to the sending terminal to inform it that the picture to be used for the insert can now be selected. Returning to decision block 1327, if the answer is yes, block 1332 is executed which resets the insert flag and transfers control to decision block 1333. The latter decision block determines whether the sending terminal is the chairperson. If the answer is no, block 1337 is executed which removes the insert picture from only the sending terminal. However, if the answer is yes, block 1334 is executed which removes the insert picture for all terminals using the chair view and updates conference record.

Returning to decision block 1326, if the answer is no, control is transferred to decision block 1357 which determines whether the sending terminal wishes to receive the chair view. If the answer is yes, block 1360 is executed to rearrange the switching system to give the sending terminal the chair view, and block 1361 is executed to send a notifying message back to the sending terminal.

Returning to decision block 1357, if the answer is no, control is transferred to decision block 1338 which determines whether one of the party buttons had been actuated on the sending terminal. If the answer is yes, block 1339 is executed which transmits a notify message to the sending terminal verifying that the message concerning the party button had been received and control is transferred to decision block 1341. The latter block determines whether one of the insert flags has been set for either of the insert buttons. If an insert flag has been set, then the party selection is defining what picture should be in that insert. If the answer to decision block 1341 is no, control is transferred to decision block 1340 which determines whether the sending terminal is the chairperson. If the answer to this question is no, block 1343 is executed to indicate in the conference record that the sending terminal is receiving the picture of the select-

ed party, and block 1344 is executed to send the necessary information to the switching system to provide the selected party's picture to the sending terminal. Returning to decision block 1340, if the answer is yes, block 1345 is executed to update the conference record to show that the chair view is now that of the picture of the selected party, block 1348 is executed to rearrange the switching system to provide the picture of the selected party to all terminals that are receiving the chair view.

Returning to decision block 1341, if the answer is yes, control is transferred to block 1349 which resets the insert flag and sends a notifying message to the sending terminal that indicates that the flag has been reset. Next, decision block 1350 is executed to determine whether the sending terminal is the chairperson. If the answer is yes, block 1351 is executed to update the conference record to indicate that the chair view is an insert view. Next, block 1354 is executed to rearrange the switching system to provide the picture of the party as an insert to all terminals receiving the chair view. Returning to decision block 1350, if the answer is no, block 1355 is executed to update the conference record to reflect the fact that the sending terminal is now receiving an insert view. Finally, block 1356 is executed to rearrange the switching system to provide the insert picture to the sending terminal.

In the other implementation of the chair view where the user of the telephone terminal first actuates the select chair person button and then the view button to obtain the desired picture, FIG. 13 would be modified to receive the chair person selection and picture information in the same message. In addition, for the user to select a new chair view, the video conference manager must receive again the previously mentioned message containing the select chair person and view information.

## Claims

1. A method for controlling a video conference between plurality of video terminals (101-104) interconnected by a telecommunication switching system with each video terminal transmitting a video picture, the method comprising the steps of:

### CHARACTERIZED IN THAT

determining (1320, 1321, 1345, 1348, 1351, 1354) a chair view picture by a first one of the video terminals wherein the chair view picture is then made available to all video terminals;

requesting (1360, 1361) delivery of the chair view picture as determined by the first one of the video terminals from the telecommunication switching system by a second one of the video terminals; and

requesting (1316, 1322, 1325) delivery of

a first video picture from the telecommunication switching system by a third one of the video terminals.

- 5 2. The method of claim 1 wherein the step of determining the chair view picture comprises the step of defining (1316, 1319, 1320) a composite of all of the video pictures transmitted to the telecommunication switching system by all of the video terminals.
- 10 3. The method of claim 2 wherein the step of determining the chair view picture further comprises the step of defining (1326, 1327, 1332, 1333) a composite of the video picture from a fourth one of the video terminals inserted into the video picture from a fifth one of the video terminals.
- 15 4. The method of claim 3 further comprises the step of requesting (1309, 1310, 1313, 1317) a second video picture from the telecommunication switching system by the first one of the video terminals without altering the chair view video picture being received by the second one of the video terminals.
- 20 5. The method of claim 4 further comprises the step of determining (1309, 1310, 1314, 1315) a new chair view video picture by the third one of the video terminals wherein the new chair view video picture is transmitted to the second one of the video terminals.
- 25 6. The method of claim 4 wherein the step of requesting delivery of the chair view picture by the second one of the video terminals comprises the step of actuating (127) a single button on the second one of the video terminals.
- 30 7. The method of claim 4 wherein the step of requesting delivery of the chair view picture by the second one of the video terminals comprises the step of using (901, 907) a visual indicator device attached to the second one of the video terminals.
- 35 8. An apparatus for controlling a video conference between plurality of video terminals (101-104) interconnected by a telecommunication switching system with each video terminal transmitting a video picture, comprising:
  - CHARACTERIZED IN THAT means (1320, 1321, 1345, 1348, 1351, 1354) for determining a chair view picture by a first one of the video terminals wherein the chair view picture is then made available to all video terminals;
  - means (1360, 1361) for requesting delivery of
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ery of the chair view picture as determined by the first one of the video terminals from the telecommunication switching system by a second one of the video terminals; and  
means (1316, 1322, 1325) for requesting delivery of a first video picture from the telecommunication switching system by a third one of the video terminals. 5

9. The apparatus of claim 8 wherein the means for determining the chair view picture comprises means (1316, 1319, 1320) for defining a composite of all of the video pictures transmitted to the telecommunication switching system by all of the video terminals. 10 15

10. The apparatus of claim 9 wherein the means for determining the chair view picture further comprises means (1326, 1327, 1332, 1333) for defining a composite of the video picture from a fourth one of the video terminals inserted into the video picture from a fifth one of the video terminals. 20

11. The apparatus of claim 10 further comprises means (1309, 1310, 1313, 1317) for requesting a second video picture from the telecommunication switching system by the first one of the video terminals without altering the chair view video picture being received by the second video terminal. 25 30

12. The apparatus of claim 11 further comprises means (1309, 1310, 1314, 1315) for determining a new chair view video picture by the third one of the video terminals wherein the new chair view video picture is transmitted to the second one of the video terminals. 35

13. The apparatus of claim 11 wherein the means (127) for requesting delivery of the chair view picture by the second one of the video terminals is responsive to actuation of a single button on the second one of the video terminals. 40

14. The apparatus of claim 11 wherein the means for requesting delivery of the chair view picture by the second one of the video terminals is responsive to use of a visual indicator device (901, 907) attached to the second one of the video terminals. 45 50

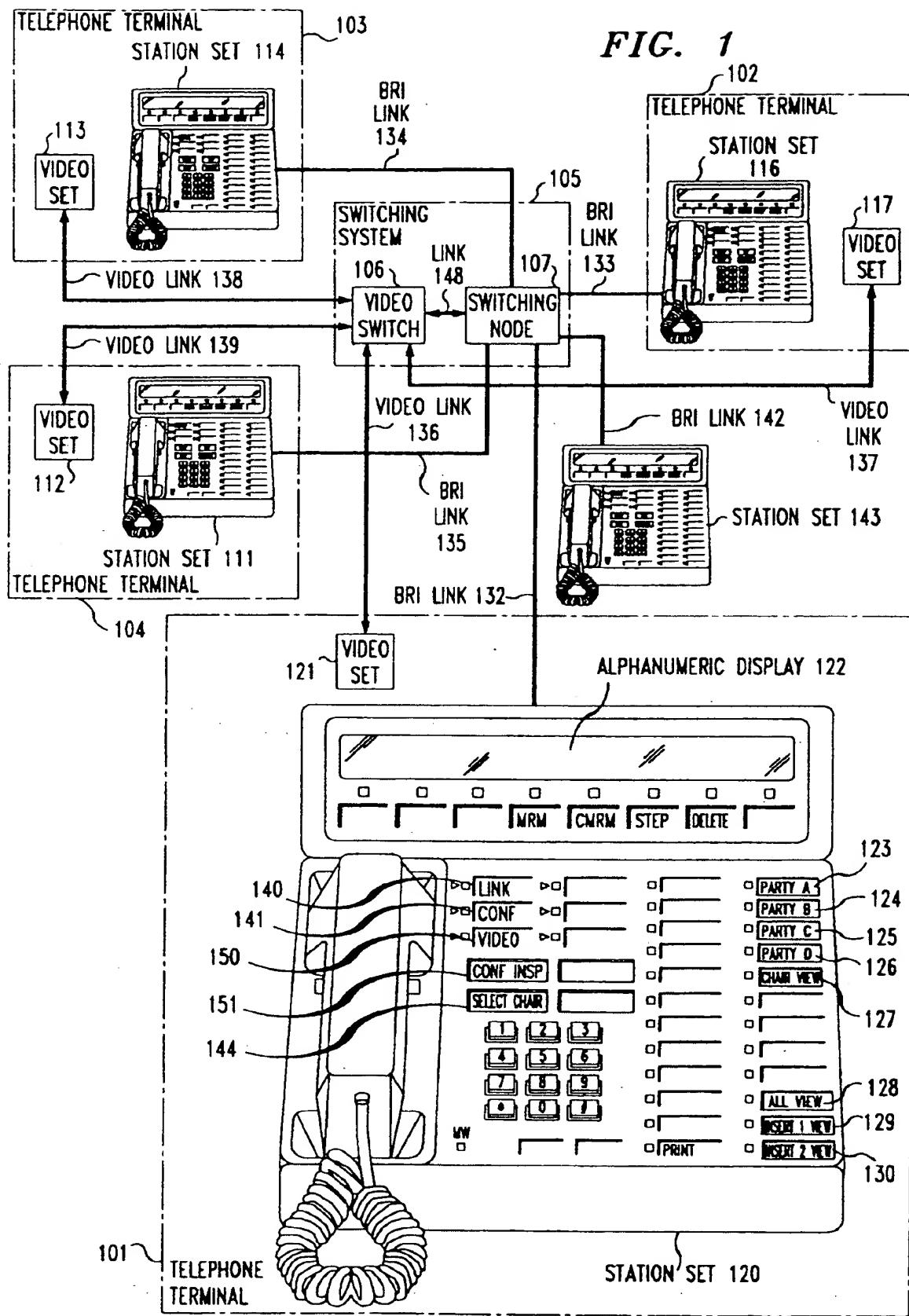


FIG. 2 MESSAGE FLOW

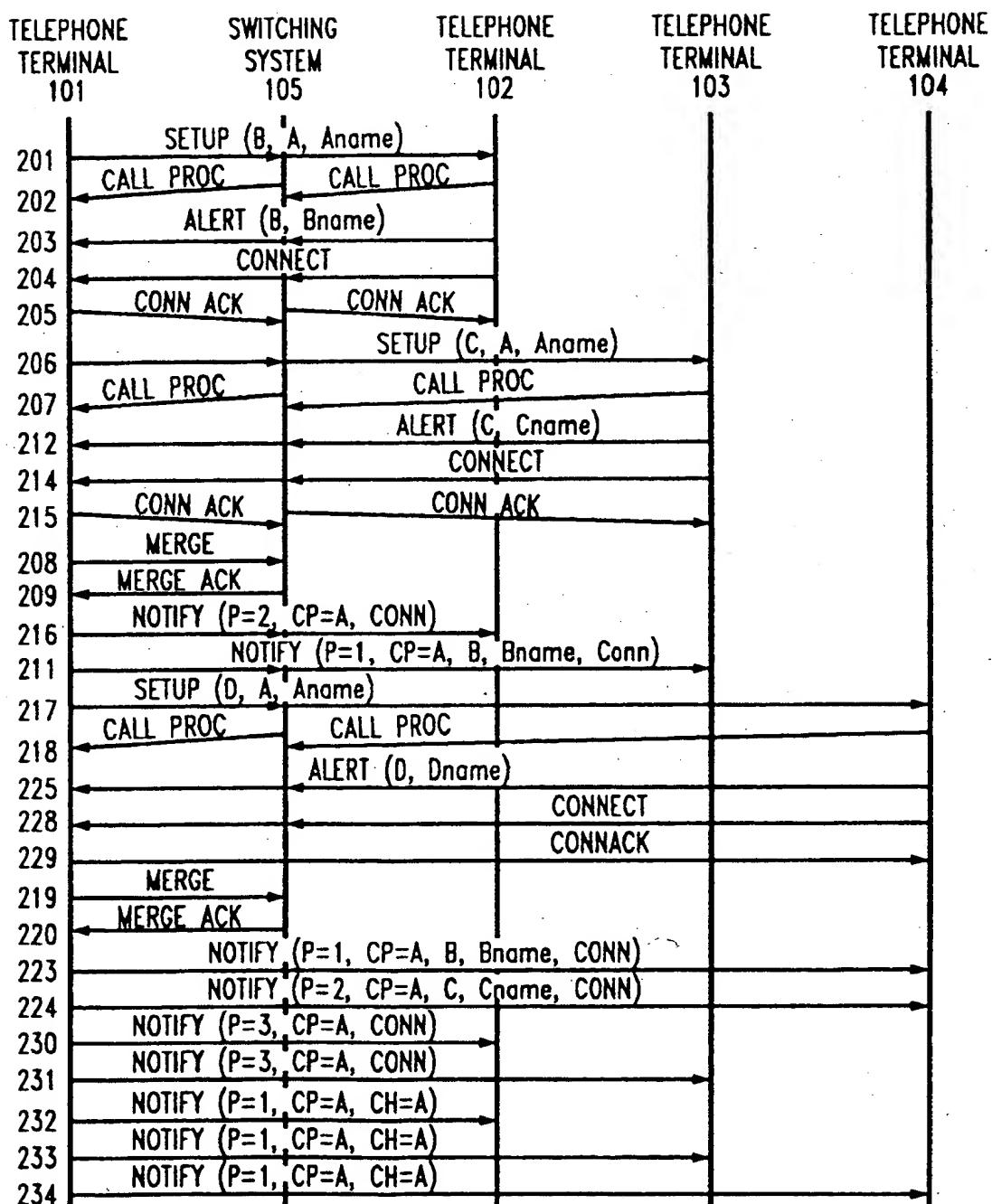


FIG. 3

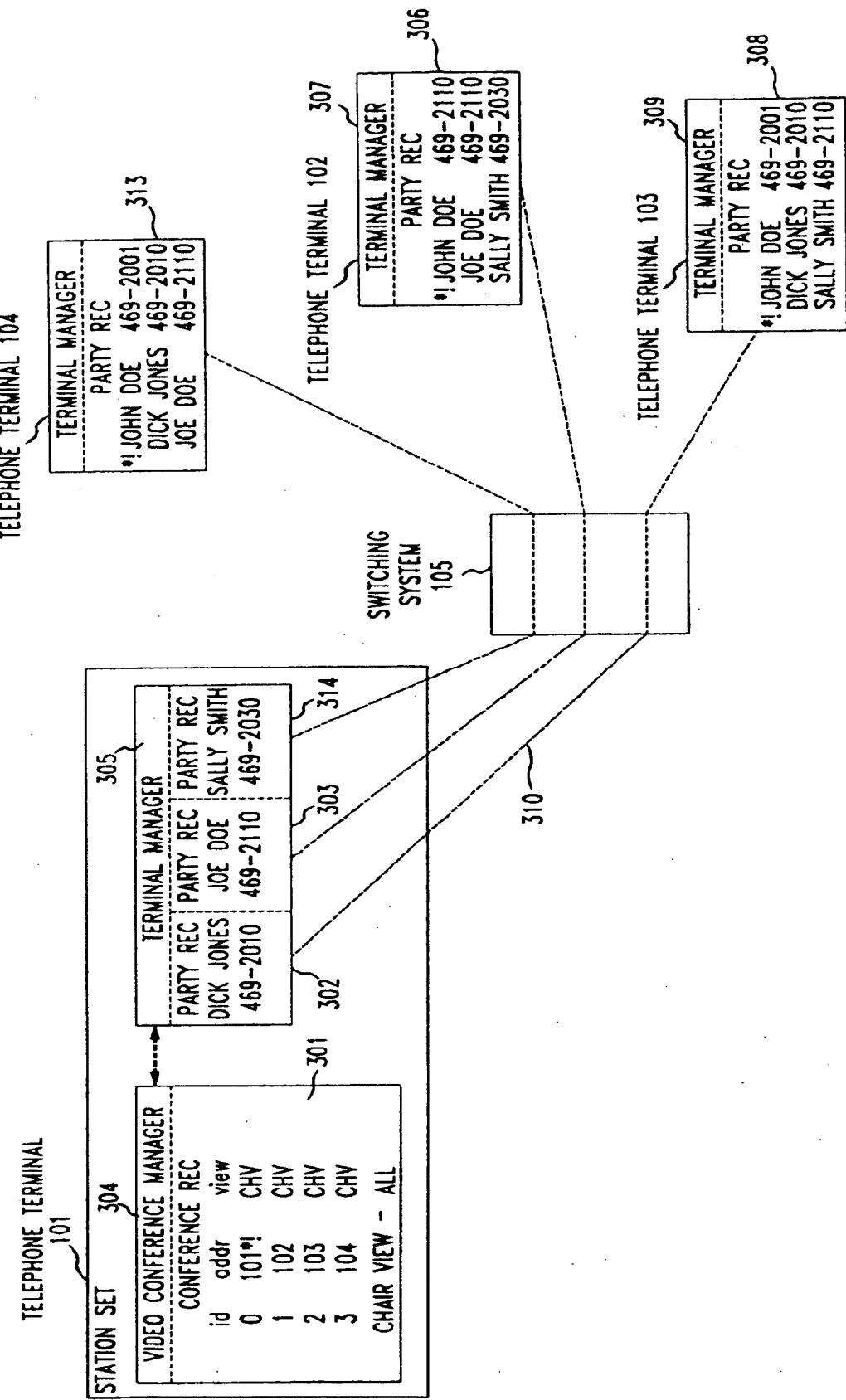


FIG. 4

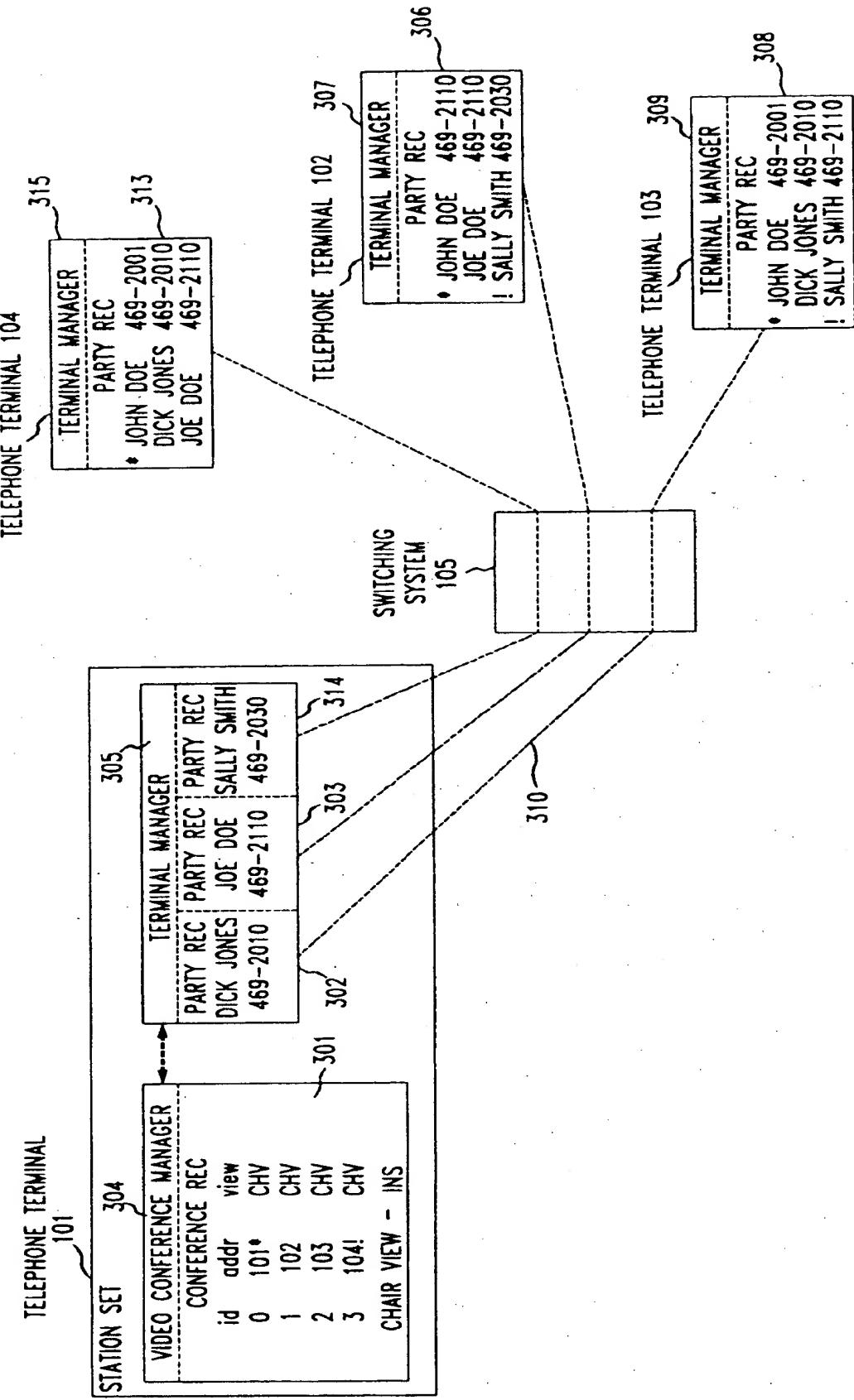


FIG. 5

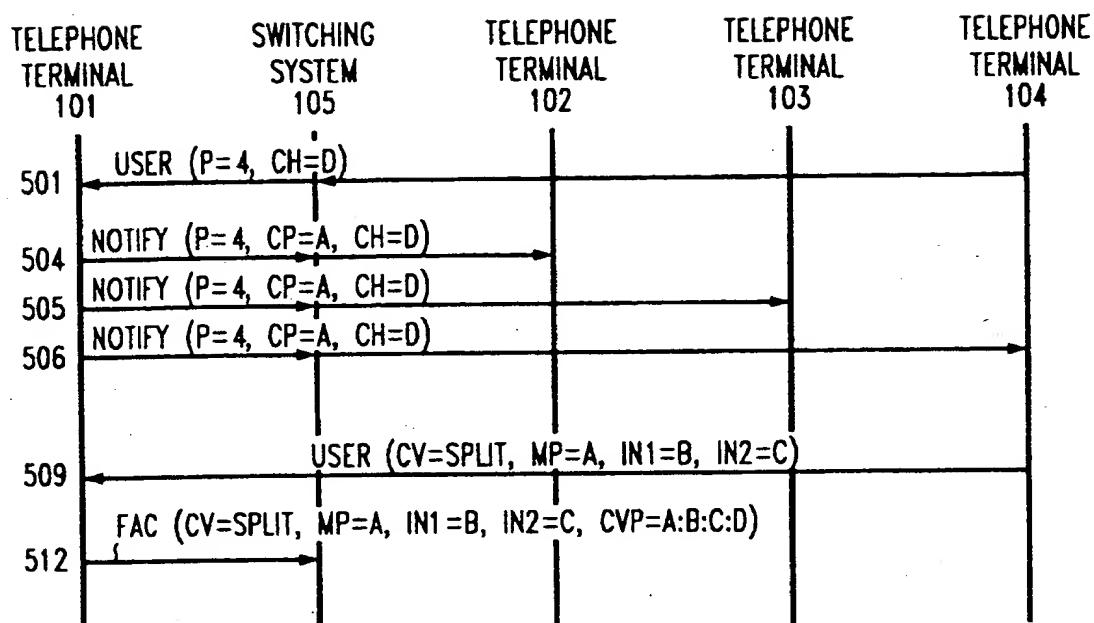


FIG. 7

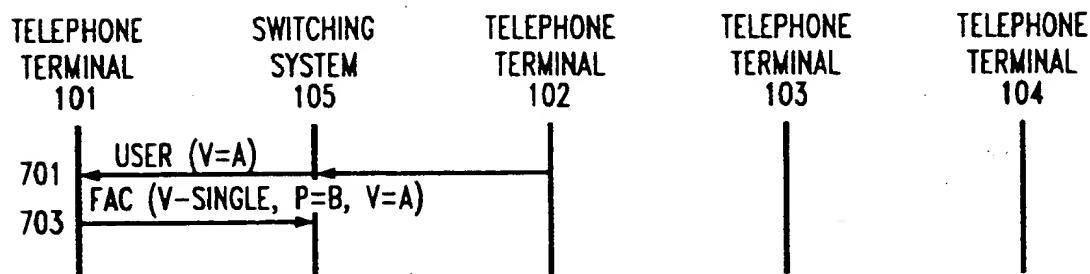


FIG. 6

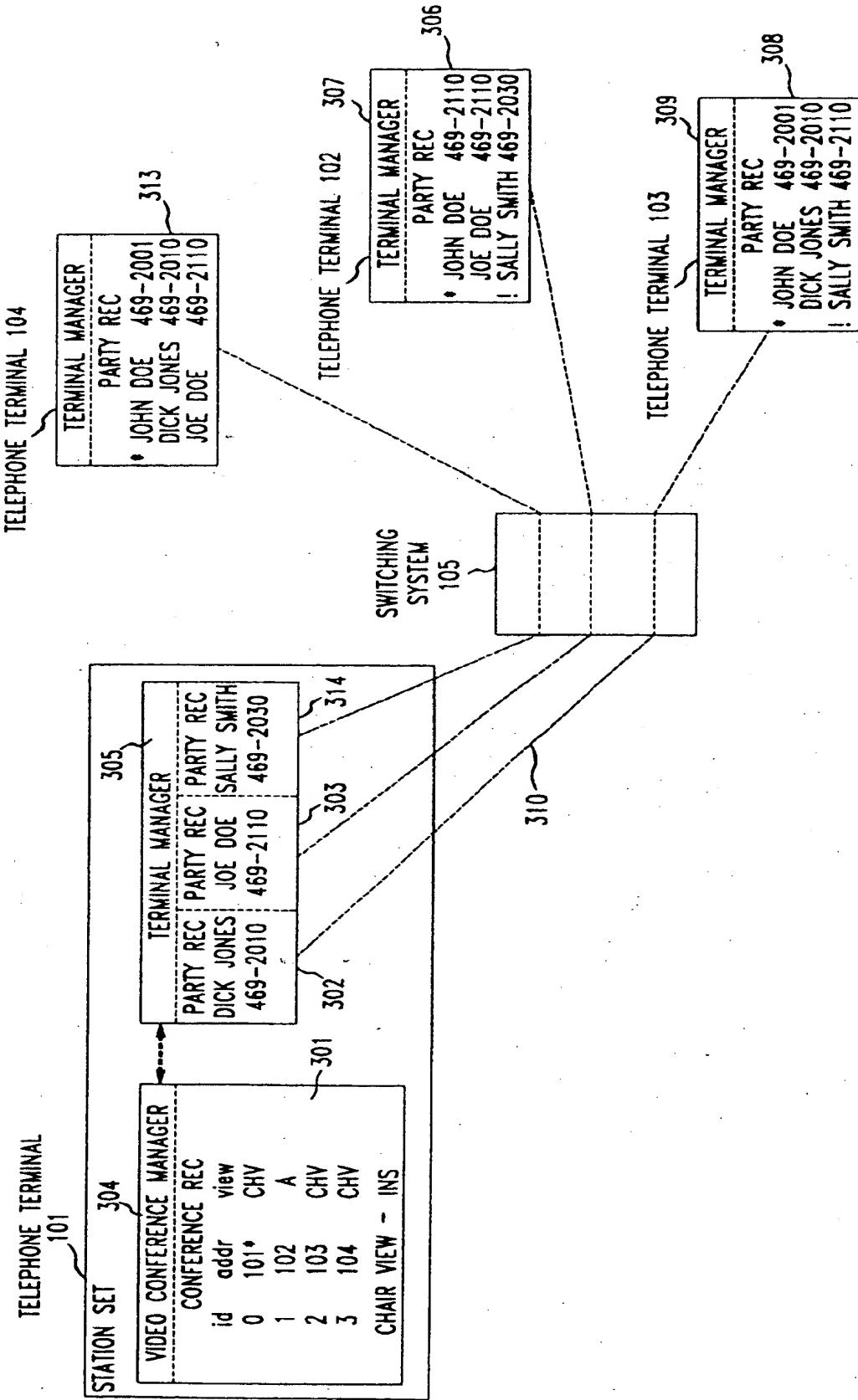


FIG. 8

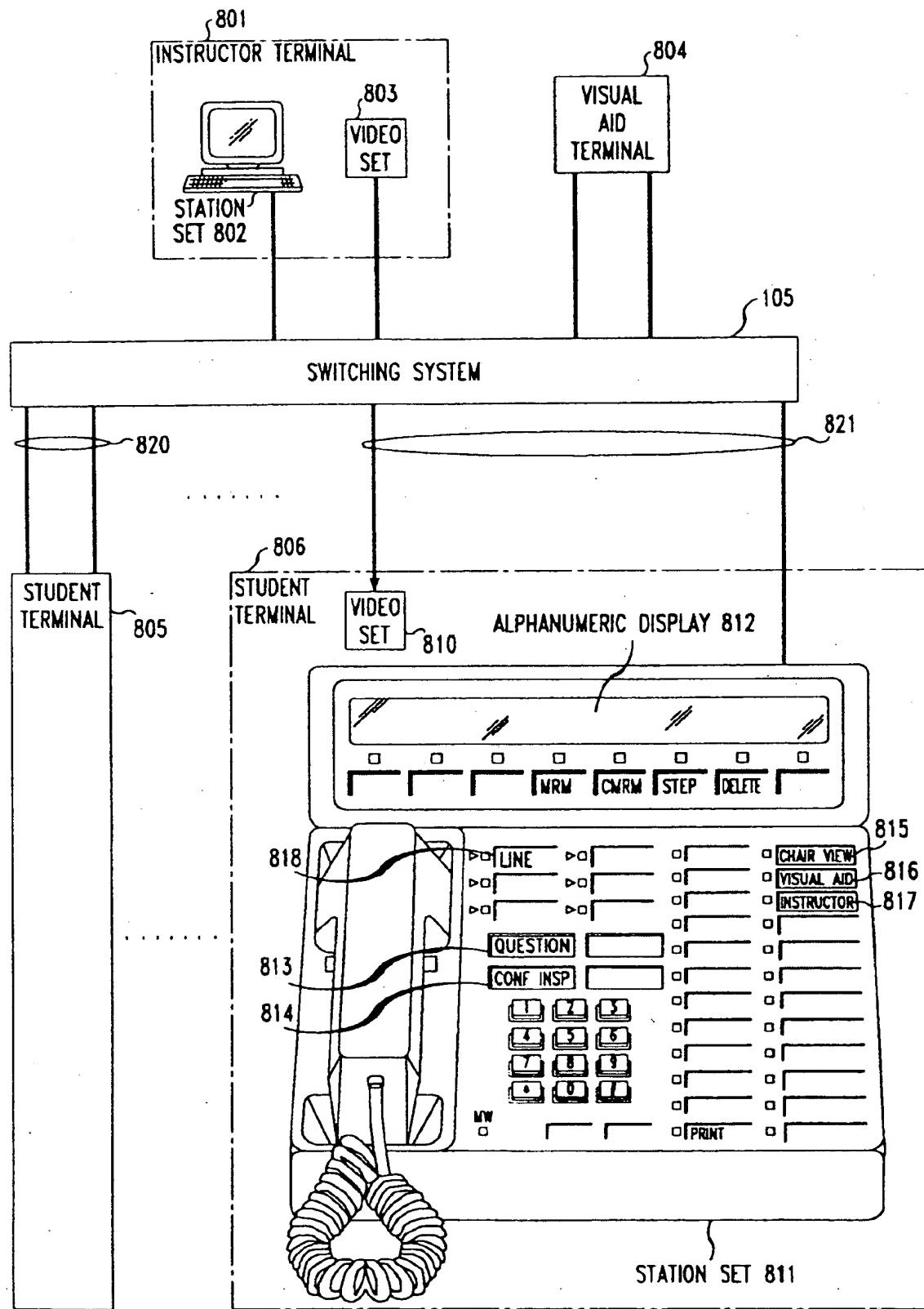


FIG. 9

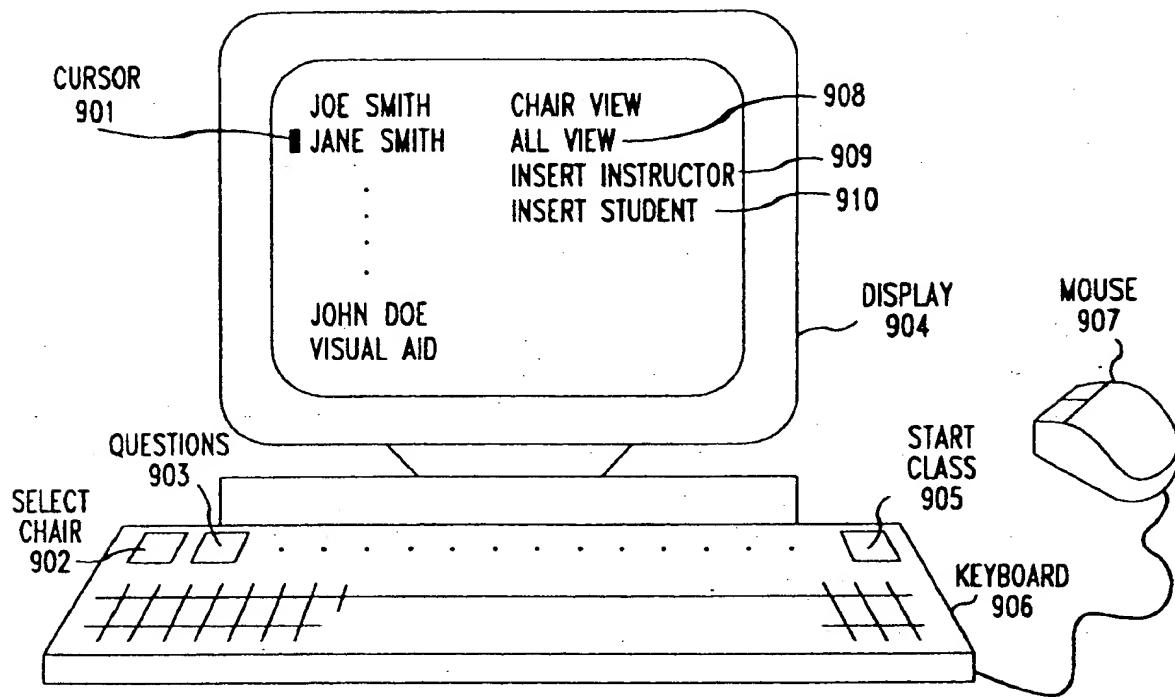


FIG. 10

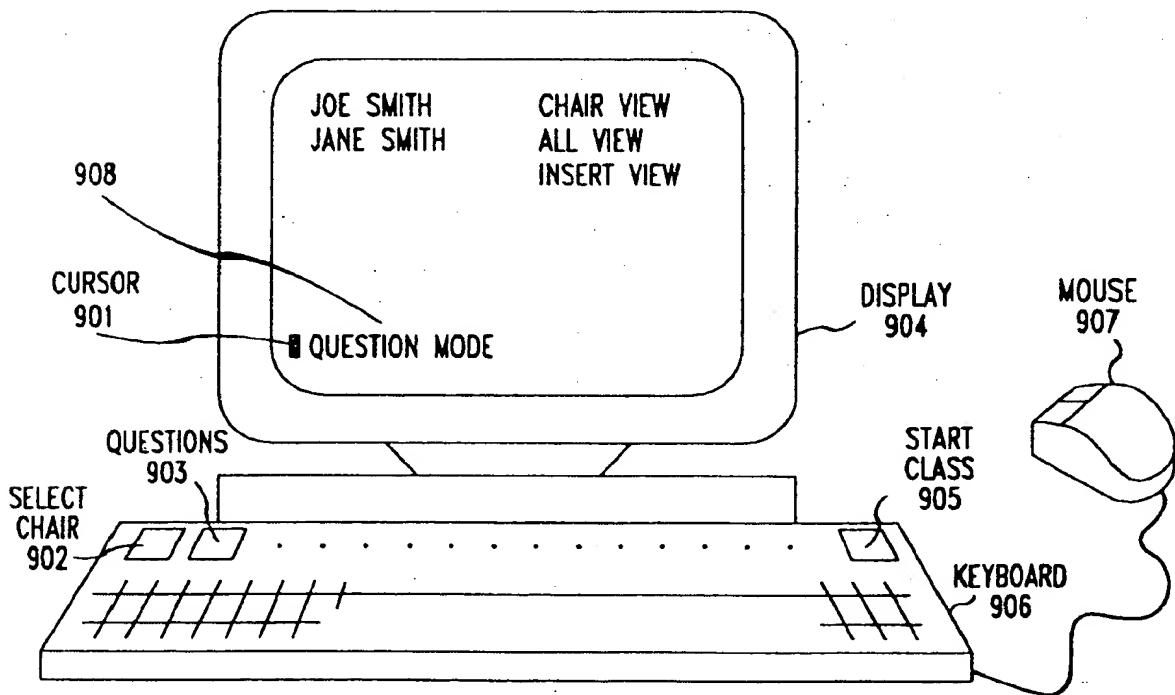


FIG. 11

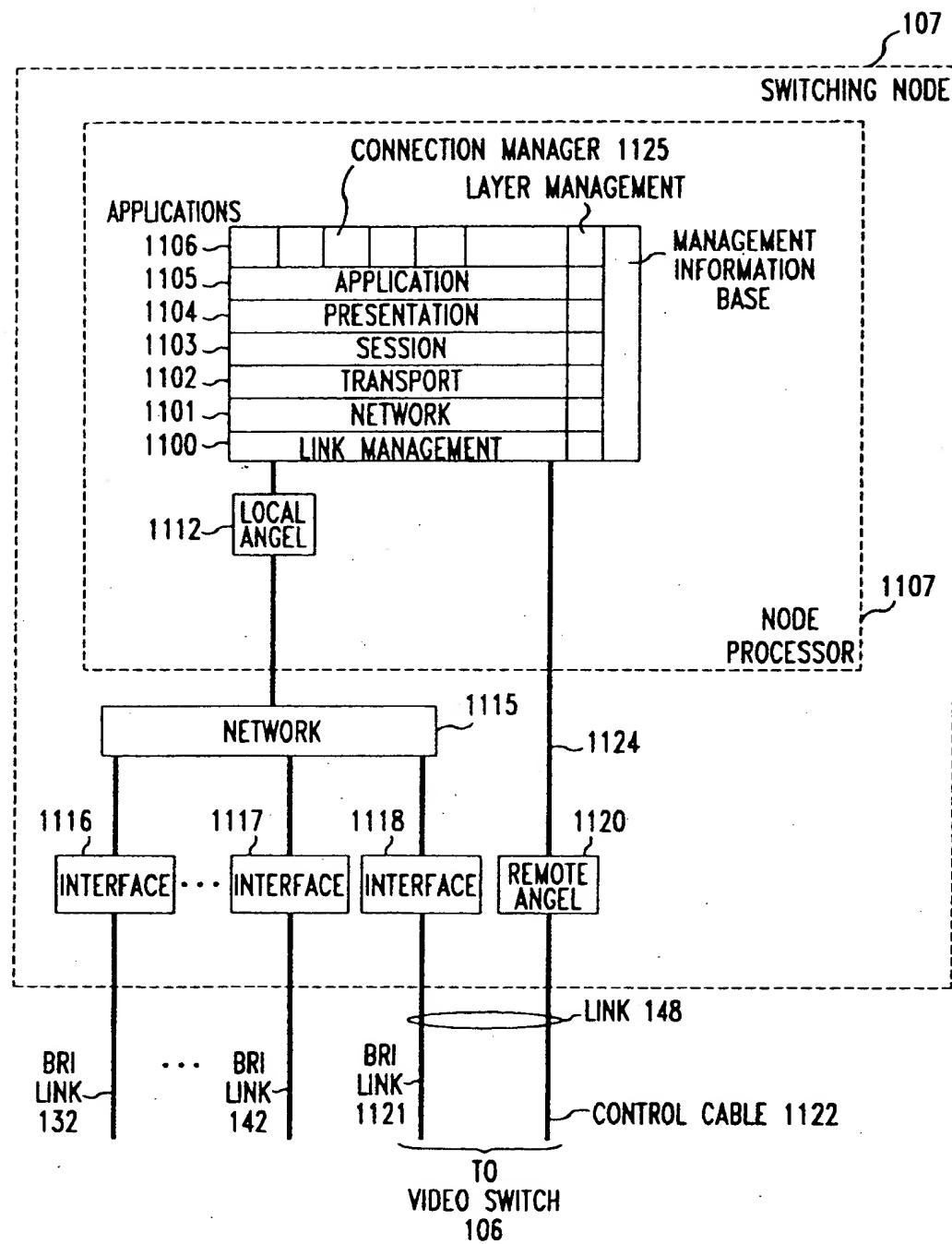


FIG. 12

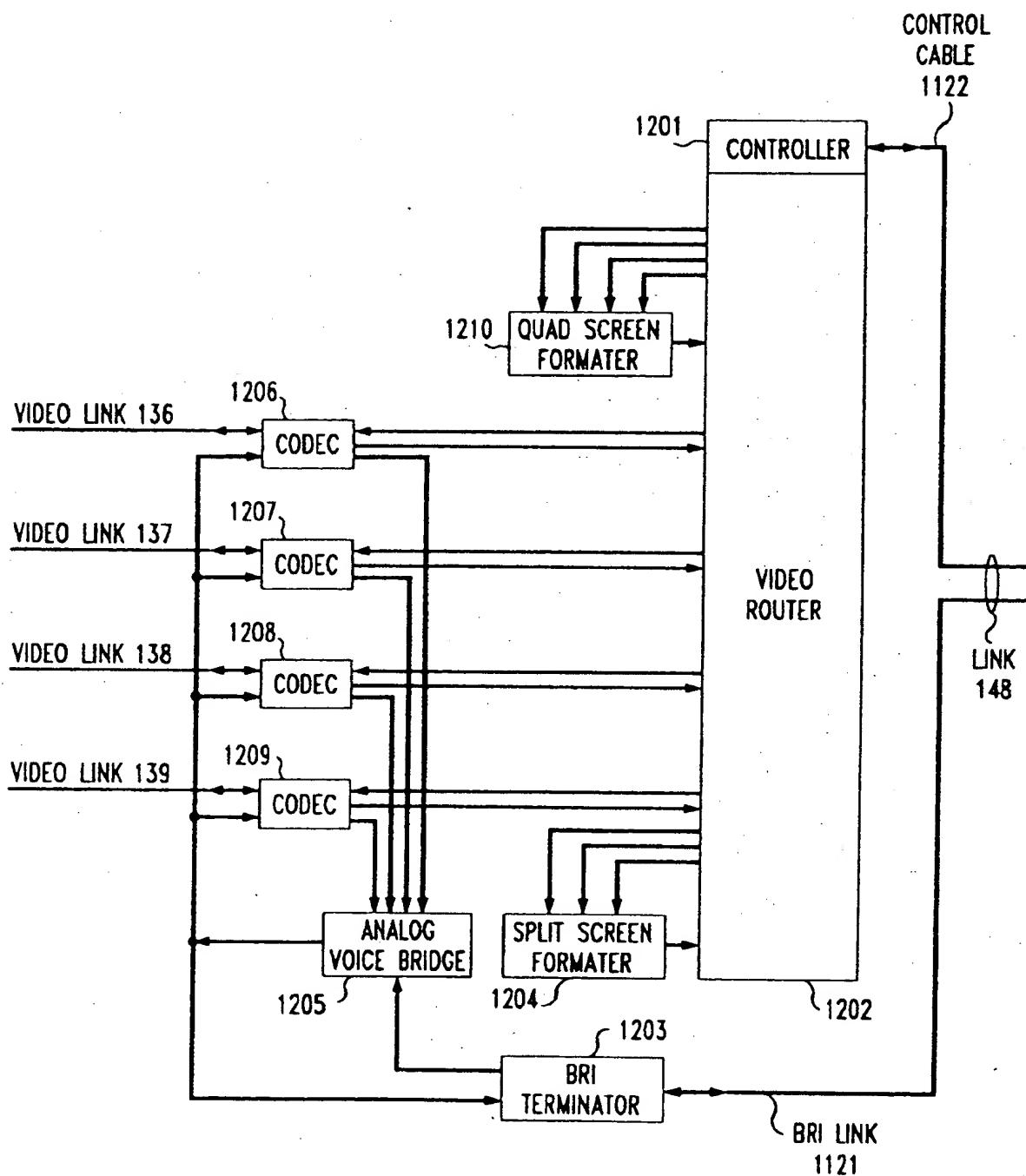
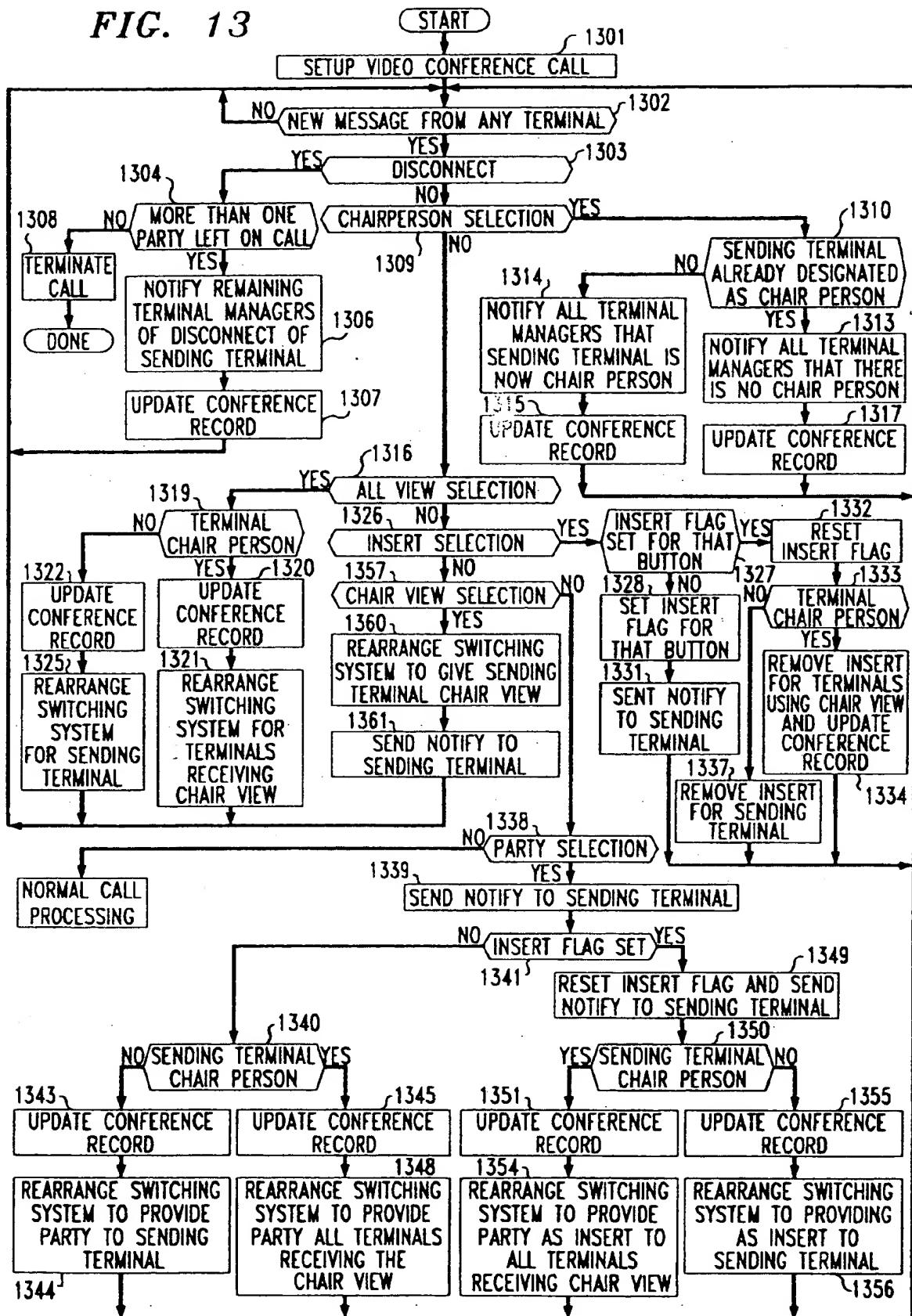


FIG. 13





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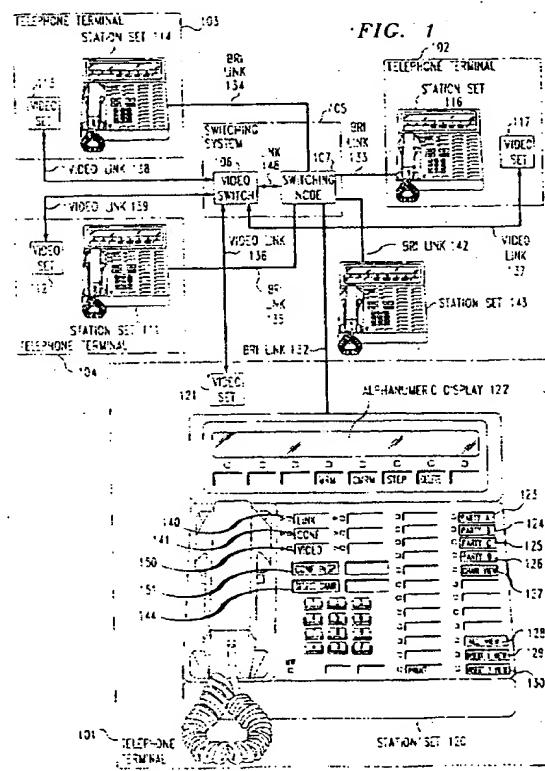
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**54) Video view selection by chairperson.**

57 A switching system (105) allows any one conferee (e.g. at 101) on a video conference to assume the role of manually manipulating (144) the video picture that will be seen by all conferees (chair view) (101-104). In addition, each individual conferee (102-104) is allowed to determine their own video picture content or to select the chair view (by 123-128). Further, anyone of conferees (101-104) can assume the role of determining the chair view. In addition, for the video classroom, a chair view video picture is composed such that the picture displays the visual aid with an insert for an instructor and an insert for a student asking a question. Further, the instructor selects by using a button (129,130) or mouse which student is to be displayed in the student insert, and the video picture automatically displays that student. In another embodiment of the system, the students request permission to ask a question by actuation of a switch on their telephone set, and the names of students asking questions are displayed on a computer display screen. The instructor then can select the student by manipulating the cursor on the computer display to select the desired student.





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## EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.6)						
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim							
Y	EP-A-0 400 668 (FUJITSU) * the whole document *	1,8 2-7,9-14	H04N7/15						
Y	IEEE INFOCOM '91-THE CONFERENCE ON COMPUTER COMMUNICATIONS, vol.3, 7 April 1991, BAL HARBOUR, FL, USA pages 1127 - 1144	1,8							
A	TANIGAWA ET AL. 'PERSONAL MULTIMEDIA-MULTIPOINT TELECONFERENCE SYSTEM' * page 1129, paragraph 3.2 * * page 1130; table 3 * * page 1132, paragraph 4.4 - page 1133, paragraph 4.4 *	2-7,9-14							
A	IEEE TRANSACTIONS ON COMMUNICATIONS, vol.39, no.11, November 1991, NEW YORK, US pages 1698 - 1708 ROBINSON ET AL. 'A MULTIMEDIA INTERACTIVE CONFERENCING APPLICATION FOR PERSONAL WORKSTATIONS' * page 1699, right column, line 37 - page 1700, right column, line 17 *	1-4, 7-11,14							
A	IEEE COMMUNICATIONS MAGAZINE, vol.30, no.5, May 1992, NEW YORK, US pages 44 - 50 W.J.CLARK 'MULTIPOINT MULTIMEDIA CONFERENCING' * page 48, left column, line 10 - page 49, left column, line 39 *	1-14							
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)						
			H04N						
<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 34%;">Examiner</td> </tr> <tr> <td>THE HAGUE</td> <td>13 December 1994</td> <td>Greve, M</td> </tr> </table>				Place of search	Date of completion of the search	Examiner	THE HAGUE	13 December 1994	Greve, M
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<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same parent family, corresponding document</p>									